Introduction

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Just like the 19th century was the century of the steam machine, the 20th was certainly a matter of collecting, processing and distributing data. A world-wide phone network was deployed, the radio and the television were invented this century, as well as the telecommunication satellite and computer science.

A characteristic of these technologies is that these technologies have progressively converged. Gradually we passed from centralized systems with generally a single central computer used by several computer scientists, to a global network of devices and distributed systems that allow users to share out calculation and storage capabilities.

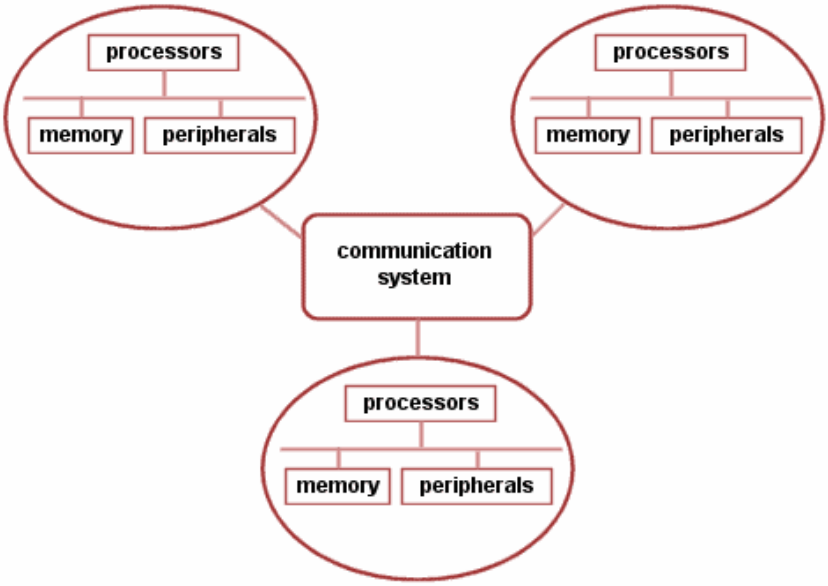
Some landmarks

- **Beginning of the 60's**:
  - flight ticket booking systems
  - distribution of banking operations
- **1969**: the American ARPA network is built to connect the main American research centres. It is the first architecture set with abstraction layers.
- **1974**: IBM invents SNA (system Network Architecture) that allows the communication between a central system and remote peripherals
- **1975**: Intel and Xerox write the Ethernet standard
- **1980**: Beginning of the Internet
- **1982**: IBM sells the Token Ring standard
- **1985**: The IEEE publishes standards for the 802.X protocols (especially Ethernet and Token Ring)
- **1989-1991**: Beginning of the Web, the main Internet application
- **1990**: Beginning of the ISDN (Integrated Services Digital Network)

From the beginning of the 80's, networks world-wide have been progressively connected together to build **the Internet**. Internet means "interconnected networks"; it is a world-wide network that provides a set of services, set that is absolutely not limited to the Web, contrary to what we could commonly think.

Definitions

A **network of computers** is a set of **independant** computers (called **nodes**) sites or **hosts** connected together and that are able to exchange data with **communication lines**:

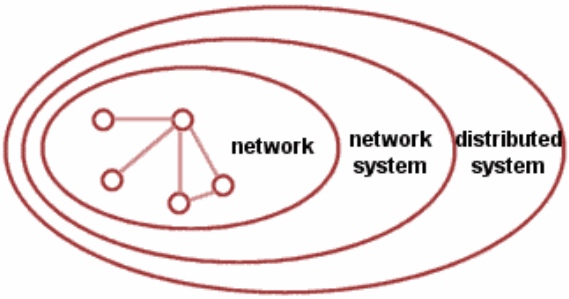


The autonomy of computers excludes any master/slave relation; therefore, any system made up of a central controling unit and several slave units (e.g. a computer with remote printers and terminals) are excluded from this definition.

We call **network system** or **network software** a set of software modules that manage communications between sites. The software is installed on every node of the network.

We distinguish computer networks and distributed systems: a **distributed system** is a set of **independant** computers connected together that host a **software** so that the distribution into autonomous computers is **transparent and not detectable** by users. In concrete terms, when a user wants to launch a program, the operating system manages to select the best processor, find and convey input files to this processor and put results at the right place.

In the case of a network, everything is *explicitely* performed (we first have to connect to a given machine, send and execute a given command on this given machine, we must explicitely move files...); although in the case of a distributed system, everything is automatically performed by the operating system. The difference is located at the operating system level, and not at the hardware level (type of computer, type of connectors...). We can sum up all this on the following outline:



Goals and use of networks

Networks have been developed for certain reasons. There are mainly 4 of them.

Resource sharing

The first reason is resource sharing: networks give access to resources (software, databases, printers...) in an way independent from the geographical location of users. For instance, we use this to access shared trading data in a company: each employee of a global company can access balance sheets.

Increasing of reliability and performances

This is the second reason. Networks can be used to duplicate vital data onto several servers; in case of problem the backup version is immediately available. The increasing of performances comes from the fact that it is easy to increase performances of a system by simply adding one or two extra computers. This latter point, associated with an economical fact (see the next goal), makes mainframes useless.

Costs reduction

The third goal of networks is cost reduction. Personal computers are indeed less expensive than mainframes (about 1.000 times less expensive), and this only for performances only 10 times less efficient. Networks also allow people to reacte faster to some events (e.g. invitations to tender) and therefore to earn (or save) money.

Access information

This is also a main goal of networks. With networks and especially the Internet, it is very easy to be informed about any kind of subject. This latter goal is a very crucial one in the way people use networks. Nowadays it is even the main goal.

Other uses

Beyond these 4 points, networks have a couple of other goals, but these appear recently in the same time as liberalization of networks and especially with the emergence of the Internet. What is remarkable is that these new goals are not needs for companies. For instance, networks can be the medium for interative games and other entertainments, as well as the medium for communication. These reasons have rather important social consequences because they influence a lot people's behaviors.

 **printable format**

 **beginning** **socioeconomic aspects**